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GROWING Opportunities

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Manitoba

WHAT IS THE FEEDING VALUE OF PASTURING YOUR POULTRY?

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Pasturing poultry has gained popularity as a novel method of rearing broilers. Some proponents claim that giving your birds access to pasture can reduce feed costs by 35% and offer profits as high as $25,000 per acre. Certainly, putting birds out on pasture is an idea that appeals to some consumers but does it really offer any savings in the amount of prepared feed that must be supplied to the birds?

A recent study[1] by researchers at West Virginia University provides a practical estimation of the feeding value of pasture for poultry. In the study, metabolizable energy and amino acid digestibility were estimated for freeze dried samples of a forage mixture containing Kentucky bluegrass, tall fescue, white clover, and red clover. The mixture was fed to Leghorn roosters that were either cecetomized, intact, or intact and conditioned to eating grasses. The cecetomized and conditioned roosters were included in the trial to help determine the importance of fermentation in the ceca in the digestion of green feed.

The researcher found A.M.E.$_n$ values of 285 to 365 kcal/kg for the pasture mixture – or about ¼ of that for alfalfa meal. Surprisingly, the values were similar regardless of whether the roosters had been cecetomized or conditioned to eating grasses. It appears that fermentation in the ceca did not significantly help to break down the fibre in the grasses and clovers.

On a positive note, the amino acid digestibility of the amino acids appeared to be quite good. The digestibility of lysine and methionine was 73% and 81% respectively. On a dry matter basis, the 17% crude protein, 0.89% lysine and 0.31% methionine content of the forage mixture was better than for wheat. On an "as is" basis, the protein and amino acid content was much lower because the grass and clover mixture contained 82% moisture before being freeze dried. Pasture may still offer a modest supply of protein and amino acids because birds can consume succulent green feed at a level equaling 20% to 30% of their intake of prepared feed.

The real question is whether high consumption of forages will limit the energy intake of the birds. Previous research indicates that the practical limit for forage consumption is about 5% of the birds' dry matter intake. Birds may be forced to eat more due to shortages of prepared feed or feed inbalances (e.g. feeding just wheat instead of prepared rations). Under these circumstances, the low energy content of forages is an obvious problem.

Birds will happily consume large quantities of grasses and clovers, especially if fresh and succulent. This green feed can help to prevent mild amino acid deficiencies as well as being a significant source of Vitamin A. While the birds may enjoy foraging, it is highly unlikely that access to pasture will significantly reduce feed consumption.

[1]Buchanan et al., 2007. Nutrient composition and digestibility of organic diets and pasture forages. Journal Applied Poultry Research, pages 13-21.

CHANGING GRAZING PATTERNS WITH MINERAL SUPPLEMENTATION

Salt and mineral have often been used to entice cattle to different parts of pasture. How effective is this as a means of grazing distribution and how does mineral and salt compare to the use of protein blocks for this purpose? A study by Derek Bailey, New Mexico State University, looked at the effectiveness of dry mineral and protein blocks as an aid in distributing grazing.

Low moisture blocks (LMB, 30% protein, 250 lb barrels) were compared with conventional dry mineral (CDM, 12% calcium, 12% phosphorus, 12% salt) over moderate and difficult terrain. Free choice salt was available in all groups. Herd intake of supplements was measured weekly. Individual animal intake and feeding frequency was estimated through the use of GPS collars on the cows. Cows registering within 10m of the supplement (CDM or LMB) were defined as having consumed that supplement.

Intake of LMB was consistent in both terrains - averaging 0.47 lbs per day. This was slightly less than the manufacturers recommended intake of 0.5-1.5 lbs/day. The intake of CDM was considerably less in difficult terrain than in moderate terrain – 53.9g (1.9oz) versus 128g (4.5oz) per cow per day. The manufacturers recommended range of intake of 2-4 oz/day was exceeded slightly in the moderate terrain and was slightly less in difficult terrain. The GPS results showed that collared cows spent only an extra 21 minutes per day more visiting the LMB feeders than the CDM (within 10m of feeders). However, they did spend 108 minutes more within 200m of the LMB than they did the CDM.

Dr. Bailey concluded that LMB were more attractive to cows and were more effective at modifying grazing patterns than conventional dry mineral. LMB would be a good alternative for providing minerals in difficult terrain and if grazing distribution is a concern.

Reference: Mineral supplementation aids grazing distribution. Derek Bailey, New Mexico State University. Feedstuffs, March 19, 2007.

DDGS AND PASTURED CATTLE

The "2007 Nebraska Beef Cattle Report Summaries" includes many research trials with DDGS fed to various groups of cattle including beef heifers, growing calves, pastured yearlings and feedlot steers. The summary and report can be located at
http://www.ianrpubs.unl.edu/epublic/pages/publicationD.jsp?publicationId=669
The following is a brief summary of two pasture trials.

Yearling Cattle

A summary of 8 experiments showed that grazing yearlings fed either 4.0 or 7.5 lbs of DDGS outgrew control cattle by 0.53 and 0.89 lbs/day, respectively. Subsequent performance in the feedlot was not affected. A summary of 6 experiments showed that each 1.0 lb of DDGS intake decreased forage consumption by 0.5 lbs. Additional analysis showed that each dollar spent on DDGS resulted in a return of $1.41 to $1.94.

DDGS supplementation versus fertilized pasture

Growth of steers fed DDGS on nonfertilized smooth bromegrass pasture was 0.58 lb/day greater than steers on fertilized and nonfertilized pasture. The efficiency of nitrogen use was over 3 times greater when nitrogen was provided to the steers as DDGS instead of fertilized pasture.

WARNING FROM CFIA

Source: www.inspection.gc.ca

The Canadian Food Inspection Agency (CFIA) is advising livestock producers across Canada not to use chemically-treated wood structures near livestock feed or food-producing animals because they can transfer potentially harmful levels of chemicals into animal products, such as meat, milk and eggs.

As part of the CFIA's residue monitoring program, dioxin levels higher than background were detected in raw milk from two British Columbia dairy operations. The dioxin was found at levels that are not considered an immediate health risk by Health Canada. The levels found did, however, trigger follow-up action to identify and eliminate the source of contamination, in line with Canada's approach to managing dioxin in the food supply. Dioxins are released into the environment through natural and industrial processes and are commonly found in low levels throughout the food chain around the world.

The CFIA and the Province of British Columbia are collaborating on this issue. The CFIA is also working with other provinces and territories to ensure this advice reaches all livestock producers. The investigation indicated that chemically-treated wood used in some silage bunkers (animal feed containers) may, in large part, be the source of the dioxin detected. Exposure to wood treated with chemicals, such as pentachlorophenol (PCP), has been shown to result in higher than background levels of dioxins in livestock feed, which can then transfer into animal products. Further follow-up after precautionary measures were implemented indicated lowered levels of dioxin.

Producers should ensure that livestock feed is not stored where it can come into direct contact with chemically-treated wood structures. Animals should also not be allowed to come into contact with chemically-treated wood, including sawdust or shavings that could be used for bedding. At a minimum, bunker silos containing this wood should be lined with a plastic tarp and untreated lumber. Gloves should be worn when handling any treated wood and scraps must be disposed of in accordance with provincial/territorial and municipal regulations.

For more information on dioxins, visit the Health Canada Web site at http://www.hc-sc.gc.ca/iyh-vsv/environ/dioxin_e.html or the CFIA Web site at www.inspection.gc.ca.

Mark Your Calendars

Mark your calendars for **June 18-21, 2007**. The Canadian Nutrition Congress 2007 will be held on those dates in Winnipeg, Manitoba, Canada, at the Winnipeg Convention Centre. CNC2007 will be a joint meeting of the Canadian Section of the American Oil Chemists' Society (CAOCS), the Canadian Society of Animal Science (CSAS) and the Canadian Society for Nutritional Sciences (CSNS). CNC2007 will mark the first time that these three societies will meet together. The potential is great for synergy and new research directions to develop as a result of cross-discipline interactions. For more information, check the conference website http://umanitoba.ca/outreach/conferences/cnc2007/

FABA BEANS IN CATTLE AND SWINE DIETS

Although research was conducted into the feeding value of faba beans throughout the prairie provinces in the 1970s, their use as a feed ingredient has been limited. The presence of tannins and other anti-nutritional factors restricted their utilization in swine and cattle diets. The development of zero-tannin (ZT) faba beans varieties (eg Cresta, Snowbird) at the University of Saskatchewan has renewed interest in this feedstuff.

Nutrient Composition

	Faba beans[1]	Peas[1]	Canola meal[2]	Soybean meal[3]
% CP	30.6	25.1	38.9	53.8
Ether extract	1.2	1.5	3.9	1.1
% NDF	15.2	18.5	23.6	9.8
% Starch	39.3	52	5.8	9.7
UIP, % CP	17.3	22	35	35
DE (cattle), mcal/kg	3.6	3.83	3.18	4.16
NE_L, mcal/kg	-	2.01	1.76	2.2
DE(swine, total tract)	4.01[4]	3.8[5]	3.45	4.09[3]
NE (swine)	2.62[4]	2.44[3]	1.94	2.24[3]
% Ca	0.12	0.12	0.7	0.33
%P	0.44	0.46	1.2	.70
% lysine	1.5	1.9	2.24	3.39

Sources: [1] The Feed Pea Focus, March 2007, [2] Canola Meal Feed Industry Guide, 2001, [3] NRC Dairy, 2001; NRC Swine 1998, [4] Prairie Swine Centre, Annual Research Report, 2004, [5] Canadian Peas Feed Industry Guide, 1994

Feeding ZT Faba beans to Dairy Cattle

ZT faba beans are similar to other pulses in starch and protein content and degradability. Although they are high in starch, the rate of starch degradability in the rumen is quite slow and is similar to that of corn. The bypass value of faba bean protein is low compared to that of canola meal or soybean meal protein. Feeding trials utilizing ZT faba beans in dairy diets is limited. However, based on feeding trials with peas and past trials with faba beans, it appears that ZT faba beans can be fed at 20-35% of the concentrate.

Feeding ZT Faba beans to Swine

Research at the Prairie Swine Centre (Annual Research Report, 2004) showed that including ZT faba beans at 30% of the ration did not affect average daily gain or average daily feed intake of grower-finisher pigs compared to those fed a soybean meal control. Further investigation is needed to better define the available energy content of faba beans.

GRAZING MANAGEMENT – KNOWLEDGE NUGGETS

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- Pasture managers view themselves as grass farmers and the livestock as a means of marketing the forage. The goal is to produce good-quality forage for as much of the year as possible and then choose livestock that best market it.

- To maintain a productive plant community requires skillful management. Understanding animal: plant interactions and their influences on overall pasture production is key.

- In setting production goals, consider the economic return per acre rather than production per animal. Compare production per acre or per dollar invested rather than weaning weights.

- Most cow-calf operations have lower nutritional needs than do stocker enterprises. If high-quality forage can be consistently produced, a stocker enterprise may be a good economic option. Different classes of cattle, horses, sheep, or goats might be more suitable for the feed source and management.

- Time controlled grazing has become popular and improves profits. Pastures are divided into paddocks where the land is grazed for short periods of time and the livestock is removed to ensure the plants have adequate time to recover before being grazed again. Because this requires more knowledge of forage plants and pasture-animal interactions, controlled grazing is often referred to as management-intensive grazing (MIG).

- Grazed pastures need less fertilizer than those that are hayed. Animals use very few nutrients from the plants they eat as most minerals are returned in animal manure and become part of a natural cycling of nutrients. When manure is evenly distributed throughout the paddocks and earthworms, dung beetles, and soil bacteria are active, nutrients will be recycled quickly.

- Soil tests and forage analysis are useful to monitor mineral nutrients in the soil and whether nutrients are actually being used by the plant. Results include fertilizer recommendations based on field history and planned use. Recommendations may not be accurate for pasture because they may not account for the recycling of nutrients by the grazing animals.

- Producers may be best able to evaluate fertilization needs based on their observations of productivity and nutrient cycling in their paddocks and using the soil test to monitor changes in soil chemistry and nutrient levels.

- Legumes in the mixture increase soil fertility, improve overall feed value and extend the grazing season. Bacteria that live in nodules on the legume roots capture atmospheric nitrogen and after the nodules separate from the roots or the plant roots die, this nitrogen becomes available to nearby plants.

- In order for legumes to persist in a pasture, manage the grass-legume mix for the legume. Grass must be kept short enough so that legumes are not shaded out. Fertilize for the needs of the legumes to avoid excessive competition.

- Many organisms live in a healthy soil ecosystem. Root systems cooperate with underground animals in a complex, highly organized system very similar to the one aboveground. The soil biological community includes large populations of bacteria, fungi, nematodes, mites, and microscopic animals.

- With continuous grazing, animals graze the most palatable plant species frequently. Root reserves are eventually exhausted and the plants die. In a controlled grazing system, animals only have access to small parts of the pasture at one time. Once grazed, plants are allowed sufficient time to re-grow and to restore their root reserves. Over time the plant community becomes more diverse.

- A sustainable pasture plan should be based on animals harvesting forage for themselves as much as possible. When pastures produce more than livestock can use, forage banking is one strategy to extend grazing into the dormant season.

- In a controlled grazing system, livestock assist in managing weeds. Because cattle have access to the paddock for a short period, their grazing is less selective. Weeds provide good nutrition while they are in young, tender growth stages, which cattle would reject when mature.

- Grazing different kinds of livestock improves weed control. Sheep and goats will complement grass-eating cattle by consuming broad leaves, blossoms, and seeds, while goats prefer brushy vegetation high in cellulose.